

Special Articles and Association Notes

The Manitoba Medical Association Review

Formerly the Bulletin of the Manitoba Medical Association

ESTABLISHED 1921

WINNIPEG, AUGUST, 1937

Published Monthly by the

MANITOBA MEDICAL ASSOCIATION

Editorial Office

101 MEDICAL ARTS BUILDING, WINNIPEG

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Annual Subscription - \$2.00

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Public Ward Services Under "The Hospital Aid Act" City of Winnipeg Cases

By

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As a result of an investigation into the cost to the City of Winnipeg of the hospitalization of patients under "The Hospital Aid Act" the City Health Department has been requested to introduce a plan of medical supervision of those public ward services for the cost of which the City is liable. During this investigation a number of facts and figures have been summarized which should be of interest to members of the medical profession.

Under the above Act the municipalities are liable for the hospital accounts at a fixed daily rate for patients unable to pay their own way. It was to be expected that during this depression, the number of admissions to the hospitals of this class of patient would increase and likewise the total costs for which the municipality is liable and, in the main, pays. Whether the great increase is warranted by general economic conditions is another question.

The following table shows the extent of this problem so far as it applies to the City of Winnipeg. The admissions are those of which notification has been received and includes those in which the City "disputes" its liability under the Act. The total fees paid are the sums paid by the City to the hospitals although the Treasurer's Department manages to collect a varying percentage from the patients.

	Total Admissions Notified	Total Fees Paid
1929	8,844	\$238,930.00
1930	10,422	266,707.00
1931	12,034	343,690.00
1932	13,535	378,970.00
1933	13,271	354,282.00
1934	14,028	339,111.00
1935	15,113	368,491.00
1936	16,120	351,409.00

The admissions have almost doubled since 1929 and it is difficult to explain the increase during the last three years. In 1933 there was a reduction in the statutory daily rate from \$1.75 to \$1.50.

CLASSES OF PATIENTS

The patients receiving these services may be put in one or other of the following groups arranged more or less in order of importance from the viewpoint of cost to the City:

1. Not on relief or allowances but unable to pay for medical services.
2. Registered under the Unemployment Relief Commission.
 - (a) Married men and families.
 - (b) Single men.
 - (c) Women's Department.
3. Under the care of the Social Welfare Commission.
4. On Old Age Pensions.
5. D. S. C. R. (War pensioners' families).
6. On Veteran Allowances.
7. On Mothers' Allowances.
8. On other small pensions and allowances.

RELATION OF THE MEDICAL HEALTH OFFICER

The Hospital Aid Act gives the Medical Health Officer considerable authority in that his written permission must be obtained prior to admission except in cases of urgency. Even where it is "unwise to delay admittance" a "certificate specifying the reason for the immediate admission of the patient" is to be mailed to the Medical Health Officer. However, the Act gives the Medical Health Officer permission to delegate his authority to the Superintendents of the hospitals thus greatly simplifying the procedure of admission. Some municipalities refuse permission for medical cases and "dispute" the urgency

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in others—a plan which would cause undue hardship and contention if applied to the City of Winnipeg cases.

RELATION OF THE PHYSICIANS

Apart from the fees received for medical attendance on those registered under the Unemployment Relief Commission (Married Men's Department) and possibly from a few in Class I. above, the physicians and surgeons give their services gratuitously and can have no financial motive for either recommending admission or extending the stay in hospital. At the same time the physicians in attendance exercise an important influence in both respects.

The question of the need for hospitalization must necessarily remain, as always, a responsibility of the attending physician in regards both to admission and to the length of stay although the Superintendent of a hospital may see fit to select the cases for which his particular hospital renders service. In general the physician in attendance has met with little or no interference when he recommends for admission or for continuance of treatment a case for which the City pays the cost of hospital care.

RELATION OF THE HOSPITALS

A feature of this investigation has been the welcome accorded offers of assistance from this Department in combating this problem. Delays are not uncommon in arranging suitable accommodation for patients on discharge or completion of active treatment. Some patients are to be transferred to institutions requiring a formal application and some are from homes where conditions are not the best for after care. Again, other patients may require periods of observation while others only nursing care. These along with other reasons for prolonging the stay in hospital, by accumulation, help to swell the total of unnecessary hospitalization and the cost to the City without adding to the welfare of the patients, the hospital, and needless to say, of the physicians in charge.

SUMMER DIARRHEA IN BABIES

Cassec (calcium caseinate), which is almost wholly a combination of protein and calcium, offers a quickly effective method of treating all types of diarrhea, both in bottle-fed and breast-fed infants. For the former, the carbohydrate is temporarily omitted from the 24-hour formula and replaced with 8 level tablespoonfuls of Cassec. Within a day or two the diarrhea will usually be arrested, and carbohydrate in the form of Dextri-Maltose may safely be added to the formula and the Cassec gradually eliminated. Three to six teaspoonfuls of a thin paste of Cassec and water, given before each nursing, is well indicated for loose stools in breast-fed babies.

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NEWS ITEMS

ZINC SULFATE PROPHYLAXIS IN POLIOMYELITIS

Following recent discoveries that certain chemicals when applied to the olfactory area of the nose appeared to protect monkeys from poliomyelitis, Armstrong and Harrison, in 1936, reported favourably on the use of picric acid and sodium alum solution for this purpose. On July 17th, 1936, a statement concerning the use of this material was made in the United States Treasury Department Public Health Reports, and since the disease was present in epidemic form in Manitoba and Alabama, the picric-alum solution was used extensively in both places.

In Manitoba the solution was applied under such varying circumstances, and with the involvement of so many unknown factors, that no serious attempt was made to evaluate its efficacy as a prophylactic. The use of this spray in Alabama was reported on by Charles Armstrong in the A.J.P.H., Feb. 1937. He was unable to arrive at any definite conclusions regarding its prophylactic effect during the epidemic in that State.

There was still so much evidence that the proper application of certain chemicals would prevent the disease in experimental animals that further investigation into the proper technique for its use in man seemed indicated. With this in view, the President's Birthday Ball Commission for Infantile Paralysis supplied funds for further research into the action of certain chemicals, to be undertaken at Stanford University, and on the technique of application at Ann Arbor, Michigan. The following extracts are from the reports on this work, appearing in the Journal of the American Medical Association June 26, 1937, under the title, "Zinc Sulfate Prophylaxis in Poliomyelitis," E. W. Schultz, M.D., and L. P. Gebhardt, M.A.:

"The remarkable protection yielded by this simple and relatively nontoxic agent in animals suggests the desirability of carrying the investigation over to man. We say 'investigation' advisedly, for it does not necessarily follow that the results which have been obtained in monkeys apply equally in man. Therefore, with the most important question still to be answered—that of its effectiveness in man—there must be no relaxation of the principles that must guide a research in carrying the investigation over to man, for, unless great care is exercised, no really helpful information will be likely to come out of such further work. In a critical review of the application of picric-alum solution in Alabama last summer, Armstrong points out the pitfalls that beset a satisfactory field test. The observations that he presents in this paper make it very clear that the application of a prophylactic measure such as this must be kept entirely in the hands of those who are fully competent to apply it properly. It is not a prophylactic measure which can be turned over to the public for self administration. It is already known that in order to be effective the agent must be actually applied to the olfactory mucosa and that adequate coverage of this area is not assured by self administration with an ordinary hand atomizer.

With these considerations in mind, we would suggest the following procedure in carrying this investigation over to man:

1. The use of a solution containing 1 per cent. zinc sulfate 0.5 per cent. sodium chloride and 1 per cent. local anæsthetic (pontocaine) as suggested.
2. The solution should be prepared with U.S.P. zinc sulfate, U.S.P. sodium chloride and distilled water.

3. It should be applied at least once every two weeks during times when the risk of infection is great. A more desirable procedure would be to apply the agent on two or three successive days and once every two weeks thereafter. The latter would naturally prove more difficult to carry out in actual practice.

4. It should be applied with an atomizer equipped with a suitable tip, and in accordance with the technique described by Dr. Max Peet in this issue of the Journal.

5. Since the zinc sulfate solution thoroughly applied in this manner, may be somewhat painful, Dr. Peet suggested several months ago that we determine whether the addition of 0.5 per cent. pontocaine to the zinc sulfate solution detracts in any way from its action. From the results of tests on 32 monkeys treated with a solution containing 1 per cent. zinc sulfate and 1.5 per cent. pontocaine, we can say definitely that pontocaine in no way detracts from the protective action of the zinc sulfate. The influence of other local anæsthetics on the prophylactic action of this agent are now being studied by us.

6. The prophylactic zinc sulfate mixture should be administered under the auspices and supervision of national, state or local health organizations, aided by members of the medical profession who have been instructed in the special technique that should be followed. This calls for some previous organization of local health forces.

7. A record should be kept in the local health office of all persons treated. These should bear the name, age, address of the person treated, dates of all treatments and a notation of any anatomic conditions in the nasal passages, which may have interfered with a satisfactory application of the solution. The general health of the individual should also be noted.

8. Those who supervise the treatment should be alert to any possible side actions, or important harmful local or general effects. While we have not observed any noteworthy growth or microscopic changes in the nasal mucous membranes of monkeys treated repeatedly with zinc sulfate, other than a mild grade of inflammation, such as may be seen at times even in untreated monkeys, it nevertheless seems important to suggest alertness to any effects which may contraindicate the general use of this agent or agents if pontocaine is included in the solution. Although there is no good reason to believe the zinc sulfate, in the small amounts required to cover the olfactory area, would produce any undesirable or harmful effects, either local or general, idiosyncrasies should be kept in mind.

9. Any objectionable or undesirable effects from the treatments should be reported to the local health officer, who should enter the information on the card and take such steps as may seem desirable.

10. In measuring the results later, only those persons who have received adequate treatments under competent supervision, and for whom there is a record of treatment on file, should be considered as having received valid treatments. Claims of self administration of the solution should not be regarded as valid.

The first practical human application of any such laboratory observation as this must of necessity be in the nature of an investigation, and unless this part of the work is carried out with care it is unlikely that any significant additional information will be obtained from such field application. While further laboratory studies may in time lead to a more satisfactory procedure, the immediate task before the profession is to make the best possible use of the most promising practical measure now available for the control of the disease."

Max M. Peet, M.D., Dean H. Echols, M.D., and Harry J. Richter, M.D., deal with the "Technique of Applying Zinc Sulfate Intranasally" in part as follows:

"The actual application of zinc sulfate solution to the olfactory area has been found more difficult than was anticipated. It is apparently much simpler to cover the olfactory area in monkeys than in human beings.

Direct nasal examination after spraying a large number of children with methylene blue showed that in practically all instances the solution did not go above the middle turbinate if an ordinary atomizer was used with the tip of the spray introduced only slightly within the nostril. . . . From our experiments in which radiopaque substances and certain dyes were used it is evident that the spray must be applied directly to the olfactory area. Such application can be made under direct vision with an atomizer with a long narrow metal tip. (DeVilbiss Atomizer No. 156, with spray tip No. 156, N.C.).

Nasal douching with the head in the Proetz position might be as effective in some children as a properly applied spray. However, it would require larger quantities of the solution with the probability that some of the anæsthetic would enter the accessory sinuses and pharynx with the possibility that the cough reflex might be abolished, thus predisposing to pneumonia. The Proetz position with instillation of zinc sulfate by dropper may of necessity be used when small children are so unco-operative that insertion of the nasal spray tip is impossible. Under these circumstances the pontocaine should be omitted. The child should be kept in the head-down position for about two minutes.

We recommend the following method of application: The subject is seated and an attendant holds the head tilted backward about 45 degrees. This is the usual position for a nasal examination. A speculum is introduced into the naris and under direct vision the spray tip is inserted upward along the septum until definitely past the middle turbinate. If it impinges on the roof of the nose it is slightly withdrawn. The bulb is squeezed the number of times required to introduce 1 cc. of solution. This amount, according to our x-ray and necropsy evidence, completely covers the olfactory area. A similar procedure is then carried out on the opposite side of the nose. Loss of the olfactory sense is thus obtained.

Only slight discomfort is felt when the spray tip is passed through the narrow cleft between the middle turbinate and the septum, or when it touches the roof of the nose. If the nasal passage is found occluded on direct inspection, the nasal mucous membrane should be shrunk by the application of ephedrine or benzadrine inhalant preliminary to the insertion of the spray tip. A power sprayer can be used instead of a hand bulb, but should not deliver more than a few pounds of pressure. The quantity delivered by the power sprayer should be definitely determined and not more than 1 cc. of the solution introduced into each side of the nose.

According to the experimental work of Schultz, a single spray of zinc sulfate and pontocaine is sufficient to protect animals for at least two weeks. However, in our experiments on man we have repeated this spray for three successive days. Such intensive spraying, while perhaps not necessary, does give greater assurance of complete coverage, since on the first application of the spray there may be small areas covered by tenacious secretions which conceivably would not be present on the same areas on succeeding days. Possibly in an extensive field application of the zinc sulfate for the prevention of poliomyelitis a single spray repeated at intervals of two weeks would be sufficient; however, we recommend daily spraying for three consecutive days, then single sprays at intervals of two weeks.

It is evident that to be effective, the spray must be directly applied to the olfactory area. We wish especially to emphasize this point. Ordinary spraying with the atomizer tip introduced below the middle turbinate will not suffice, except in isolated instances. Therefore, to offer a child the only protection now

known for the prevention of infantile paralysis, the spray solution must be actually applied to the olfactory area, and this can be accomplished only under direct observation, with proper equipment and by one trained in this particular technique. It is not a procedure which can be applied by the parents, or by a physician not familiar with intra-nasal work."

Apparently the application of the zinc sulfate solution, with or without the pontocaine, to the olfactory area, causes a temporary loss or impairment of the sense of smell, which returns in from one to two weeks.

The 1 per cent. zinc sulfate solution when used alone causes burning, smarting and coryza and more or less severe headache which may last for several hours. If the solution only reaches the lower part of the nasal passage and does not cover the olfactory area, these symptoms do not appear. The addition of the pontocaine (1%) (Winthrop) completely eliminates or minimizes the discomfort following the use of the zinc sulfate alone. The intensity of these reactions varies with different individuals. —C. R. D.

COMMUNICABLE DISEASES REPORTED

Urban and Rural - June, 1937.

Occurring in the Municipalities of:

Measles: Total 569—Winnipeg 196, Brenda 103, Arthur 38, St. James 26, Unorganized 26, Kildonan East 16, Norfolk North 10, St. Clement 10, Boissevain 8, St. Vital 8, Melita 6, Rockwood 6, Rosburn Village 4, Springfield 4, Whitehead 4, Napinka 3, Rosburn Rural 2, Whitewater 2, Albert 1, Assiniboia 1, Brandon 1, Dauphin Town 1, Edward 1, Flin Flon 1 Rhineland 1, Shell River 1, Shoal Lake Rural 1, St. Andrews 1, St. Boniface 1, The Pas 1, Winnipeg Beach 1 (Late Reported: March, Springfield 1; April, St. Boniface 2; May, Rockwood 32, Brooklands 5, St. James 2, Brenda 1, Rosser 1).

Whooping Cough: Total 441—Winnipeg 241, Unorganized 81, St. Boniface 66, Kildonan West 17, Norfolk North 14, Macdonald 12, Kildonan E. 5, Winnipeg Beach 1 (Late Reported: May, Kildonan West 2, Kildonan East 1; March, Unorganized 1).

Scarlet Fever: Total 90—Winnipeg 38, Albert 8, Archie 4, Teulon 3, Armstrong 2, Fort Garry 2, Kildonan West 2, Rockwood 2, Arthur 1, Cartier 1, Lac du Bonnet 1, Macdonald 1, Russell Town 1, St. Boniface 1, Thompson 1, Whitemouth 1.

Chickenpox: Total 84—Winnipeg 41, Flin Flon 7, Grandview Town 6, Brandon 4, Lorne 4, Kildonan East 1, Mossey River 1, St. James 1 (Late Reported: May, Mossey River 9, Flin Flon 5, Kildonan East 4, Kildonan North 1).

Tuberculosis: Total 66—Winnipeg 19, Brandon 12, Flin Flon 3, Brokenhead 2, Harrison 2, Kildonan East 2, Rockwood 2, Selkirk 2, St. Andrews 2, Unorganized 2, Bifrost 1, Dauphin Town 1, Dauphin Rural 1, DeSalaberry 1, Ethelbert 1, Hillsburg 1, Kildonan West 1, Lac du Bonnet 1, Lawrence 1, Macdonald 1, Portage City 1, Stanley 1, St. Boniface 1, St. James 1, St. Rose Rural 1, St. Vital 1, Teulon 1, Woodlands 1.

Mumps: Total 15—Winnipeg 6, Brooklands 3, Harrison 1, St. Boniface 1, Unorganized 1 (Late Reported: May, Brooklands 3).

German Measles: Total 10—Roland 5, Kildonan North 1 (Late Reported: May, Kildonan West 4).

Erysipelas: Total 10—Winnipeg 6, St. Boniface 2, Kildonan West 1, Morton 1.

Influenza: Total 10—(Late Reported: April, Garson Village 1, Hartney Town 1, Macdonald 1, Pilot Mound 1, Portage City 1, Roland 1, Shell River 1, St. Andrews 1, St. Clement 1, Unorganized 1).

Diphtheria: Total 8—Winnipeg 3, McCreary 2, Carman 1, Roblin Town 1, St. James 1.

Trachoma: Total 3—Stanley 3.

Anterior Poliomyelitis: Total 1—Glenella 1.

Puerperal Fever: Total 1—Winnipeg 1.

Diphtheria Carriers: Total 1—Winnipeg 1.

Veneral Disease: Total 100—Gonorrhoea 70, Syphilis 30.

DEATHS FROM ALL CAUSES IN MANITOBA

For the Month of May, 1937.

URBAN—Cancer 35, Pneumonia 24, Tuberculosis 7, Measles 4, Syphilis 2, Influenza 1, all others under 1 year 4, all other causes 159, Stillbirths 16. Total 252.

RURAL—Cancer 18, Pneumonia 18, Tuberculosis 17, Influenza 9, Measles 2, Typhoid Fever 2, Whooping Cough 1, Syphilis 1, all others under 1 year 6, all other causes 189, Stillbirths 15. Total 277.

INDIAN—Tuberculosis 8, Influenza 3, Pneumonia 3, all others under 1 year 2, all other causes 7, Stillbirths 0. Total 23.

Medical Library University of Manitoba

Current Medical Literature

The Canadian Medical Association Journal— June, 1937.

Control of Diabetes Mellitus with Protamine Zinc Insulin in Surgery (Based upon a Study of 25 Cases). By A. F. Fowler, E. H. Bensley and I. M. Rabinowitch, Montreal.

Spontaneous Subarachnoid Haemorrhage and Brain Tumour (a Report of 3 Cases). By C. K. Russell, M.D., F.R.C.P. (C.) and J. Kershman, M.Sc., M.D., Montreal.

Practical Perimetry: Construction and Operation of the Tangent Screen. By A. J. McLean, M.D., F.A.C.S., Portland, Ore., U.S.A.

Experimental Gas Embolism: 1. Intravenous Air Embolism. By H. F. Richardson, B. C. Coles and G. E. Hall, Department of Medical Research, Banting Institute, University of Toronto.

A Case of Congenital Malformations of Vessels of the Brain and Spinal Cord. By J. A. Hannah, B.A., M.D., C.M., Toronto.

Multilocular Polycystic Tumour of the Pancreas. By Robert E. McKechnie, II, M.D., Fellow in Surgery, The Mayo Foundation and James T. Priestley, M.D., Division of Surgery, The Mayo Clinic, Rochester, Minn.

The Treatment of Scoliosis. By R. G. Huckell, M.D., Edmonton.

Hay Fever in Alberta. By Heber C. Jamieson, M.B., Edmonton.

Coincidental Diabetes Mellitus and Renal Glycosuria. By E. Lozinski, M.Sc., M.D. and L. I. Frohlich, B.Sc., M.D., C.M., Montreal.

Puerperal Infection. By Ross Mitchell, M.D., Winnipeg.

A New Method of Rhinoplasty for Sinking of the Tip of the Nose. By J. N. Roy, F.A.C.S., Professor in the University of Montreal.

Haematoma of the Abdominal Wall Simulating Intra-

Abdominal Tumour. By Hermann M. Robertson, C.B.E., F.R.C.S. (Edin. & C.), F.A.C.S., Victoria, B.C.

A Table for the Degree of Involvement in Chronic Arthritis. By Douglas Taylor, B.A., M.D., C.M., Demonstrator in Medicine, McGill University; Associate in Medicine at the Royal Victoria Hospital, Montreal.

Measurement of Blood Loss in Nose and Throat Operations. By F. D. McKenty, M.D., F.R.C.S. (C.), Winnipeg.

Internal Secretions and Cancer. By Pauline Beregoff-Gillow, Ph.G., N.S., M.D., Formerly Director of Experimental Medicine and Professor of Pathology and Parasitology of the University of Cartagena, Colombia, S.A., Ex-Fellow in Cancer Research of the New York City Cancer Institute, Montreal.

Modifications of Marshall's Clinical Method for the Determination of Urinary Urea. By Andrew Hunter, Toronto.

Some Recent Advances in the Treatment of Certain Conditions of the Anus, Rectum and Colon. By Lionel E. C. Norbury, O.B.E., M.B., B.S., F.R.C.S., Senior Surgeon, St. Mark's Hospital for Rectal Diseases; Surgeon, Royal Free Hospital; Consulting Surgeon, Belgrave Hospital for Children and West Middlesex County Hospital.

The Conservative Treatment of Acute Infections. By Sir David Wilkie, Professor of Surgery, University of Edinburgh.

The Diagnosis and Treatment of Gall-Stones. By Richard Warren, F.R.C.S., Consulting Surgeon, London Hospital.

Glaucoma. By W. B. Inglis Pollock, F.R.F.P.S.G., Surgeon, Glasgow Eye Infirmary.

Influenza in Adolescents. By Ronald E. Smith, M.B., M.R.C.P., Medical Officer of Rugby School.

The Common Cold. By W. G. Scott-Brown, M.D., Camb., F.R.C.S., Assistant Surgeon, Central London Throat, Nose and Ear Hospital.

Endometrioma of the Vulva. By T. N. A. Jeffcoate, M.D., Liverpool, F.R.C.S., Edin., M.C.O.G., Hon. Assistant Surgeon, Women's Hospital and Maternity Hospital, Liverpool; Tutor in Clinical Gynaecology, University of Liverpool.

The Clinical Journal—June, 1937.

The Indications for Caesarean Section. By Andrew M. Claye, M.D., F.R.C.S., Honorary Obstetric Surgeon, Leeds Maternity Hospital; Honorary Surgeon, Hospital for Women at Leeds; Professor of Obstetrics and Gynaecology, University of Leeds.

Lung Abscess. By James Maxwell, M.D., F.R.C.P., Physician, Royal Chest Hospital; Assistant Physician, St. Bartholomew's Hospital; Consulting Physician, Royal National Sanatorium, Bournemouth.

Some Clinical Aspects of Myocardial Disease. By Thomas F. Cotton, M.D., C.M., McGill, F.R.C.P., Lond., Physician, National Heart Hospital.

Cataract and the Cataract Patient. By A. J. Ballantyne, M.D., Professor of Ophthalmology, Glasgow University.

Cystic Hygroma. By Hamilton Bailey, F.R.C.S., Surgeon, Royal Northern Hospital.

Haemophilia. By G. L. Lyon-Smith, M.B., M.R.C.P., Assistant Physician, Royal Sussex County Hospital.

Anxiety. By H. Wilfred Eddison, M.A., M.D., D.P.M., Camb., Medical Superintendent, Wonford Mental Hospital, Exeter.

Fibroid Impacted in the Pelvis; Forceps Delivery. By Michael W. Bulman, M.D., M.S., F.R.C.S., M.C.-O.G., Obstetric and Gynaecological Surgeon, Norfolk and Norwich Hospital.

Lancet—March 6, 1937.

Thrombo-Angitis Obliterans. By E. D. Telford, B.Chir., Camb., F.R.C.S., Eng., Emeritus Professor of Surgery, University of Manchester. (From the Department of Clinical Research in Disorders of the Autonomic Nervous System, Manchester Royal Infirmary).

The Medical Treatment of Non-Malignant Pyloric Stenosis in Adults. By T. Izod Bennett, M.D., F.R.C.P., Lond., Physician with Charge of Out-Patients, Middlesex Hospital, London.

A Review of Gold Therapy. By W. S. C. Copeman, M.D., Camb., M.R.C.P., Lond., Physician to the British Red Cross Society's Clinic for Rheumatism, London, and Assistant Physician to the Children's

Department of the West London Hospital; and W. Tegner, B.M., Oxon., M.R.C.P., Lond., Chief Assistant at the Clinic.

Striae Atrophicae Cutis. By David B. Rosenthal, M.D., Melb., M.R.C.P., Lond., Medical Superintendent of the Gresswell Sanatorium, Mont Park, Victoria, Australia.

Anaesthesia for Intracranial Operation. A New Technique. By Philip Ayre, M.R.C.S., Eng., Anaesthetist to Royal Victoria Infirmary and Newcastle General Hospital; and Hon. Anaesthetist to Babies' Hospital, Newcastle-Upon-Tyne.

Lancet—March 13, 1937.

The Treatment of Acute Rheumatism in Childhood. By Reginald Lightwood, M.D., F.R.C.P., Lond., Assistant Physician for Diseases of Children at the Westminster Hospital; and Physician to Out-Patients at the Hospital for Sick Children, Great Ormond Street, London.

Nitrous Oxide Analgesia in Obstetrics. A New Type of Machine for Self-Administration of Gas. By Chassar Moir, M.D., F.R.C.S., Edin., F.C.O.G., Reader in Obstetrics, University of London, at the British Postgraduate Medical School.

Turmeric (Curcumin) in Biliary Diseases. By Albert Oppenheimer, M.D., Assistant Professor of Roentgenology to the American University of Beirut, Lebanon.

The Anti-Curare Action of Substance 36: Closely Related to Prostigmin. By Grace Briscoe, M.B., Lond. (From the Physiological Laboratory, London (R.F.H.) School of Medicine for Women).

Sporadic Salmonella Infections: with a case report. By J. H. Fisher, M.B., Sydney, M.R.C.P., Lond., Medical Registrar at the Southend-On-Sea General Hospital.

Hernio-Appendicectomy. By John T. Morrison, O.B.E., F.R.C.S., Honorary Surgeon, Royal Southern Hospital, Liverpool; Lecturer in Clinical Surgery, University of Liverpool.

Sulphaemoglobinaemia Following Sulphanilamide Treatment. By George Discombe, B.Sc., Lond., Junior Demonstrator of Chemical Pathology, St. Bartholomew's Hospital, London.

The Practitioner—June, 1937.

CARE OF THE PRE-SCHOOL CHILD

The Care of the Pre-School Child: Foreword. By the Rt. Hon. Sir Kingsley Wood, P.C., M.P., Minister of Health.

Acute Respiratory Disorders in the Pre-School Child. By Charles McNeil, M.A., M.D., F.R.C.P., Professor of Child Life and Health, Edinburgh University.

Tuberculosis in the Child of Pre-School Age. By Leonard Findlay, M.D., D.Sc., F.R.C.P., Physician, Princess Elizabeth of York Hospital for Children.

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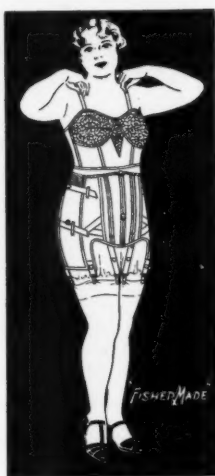
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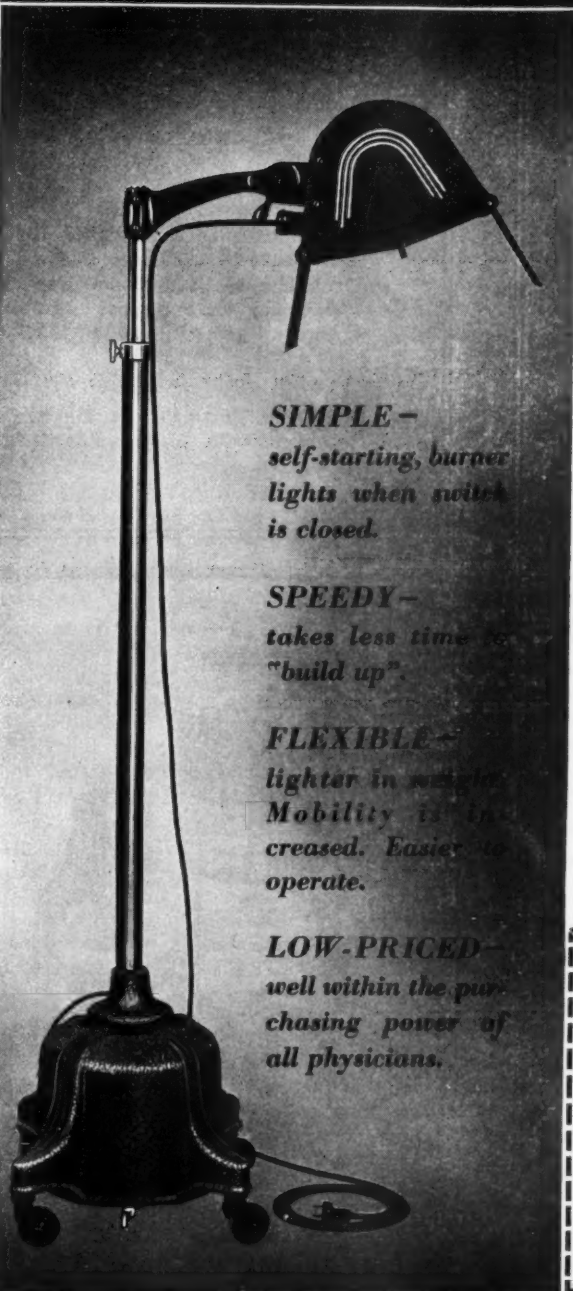
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Clinical Section

The Prevention and Treatment of Deformities Arising in the Course of Infantile Paralysis

By

ANGUS A. MURRAY

M.D., Ch.M. (Man.), F.R.C.S. (C.)

The prevention and treatment of deformities arising in the course of infantile paralysis is a very wide subject. It is not expected that we should here attempt to discuss it in detail. These notes are a continuation of the subject onward from where the previous paper left off. Let us limit ourselves to a discussion of some of the general principles which should guide us in dealing with the problems which confront us at the present time, particularly in reference to the 1936 epidemic in this Province.

Anterior poliomyelitis is one of the greatest scourges that affects humanity. If one were to classify the patients found in a cripple children's hospital one would find that 30 to 40 per cent of the cases were residual infantile paralysis. The means for the prevention of the disease are limited. We have had epidemics in 1936, 1928, 1920 and 1917, and it is certain that we will have others in the years to come.

For purposes of description the course of infantile paralysis is divided into three stages. *First Stage:* The period beginning with the onset of the disease and lasting until muscular pain and tenderness have disappeared, two months or even longer. *Second Stage:* The convalescent stage, i.e., the period during which remedial treatment for the restoration of muscular disability is carried on. It lasts until the process of recovery has ceased, probably 2 to 3 years. *Third Stage:* The period from the time recovery has ceased, onwards for the remainder of the patient's life. This is the stage of residual paralysis. The line of demarkation between these different stages cannot be sharply drawn because they merge one into the other.

The Acute Stage: During this stage we should rest the patient, avoid meddlesome therapeutics, and prevent deformities. At this time we should not use lamp treatment, electricity or massage. We think that massage should not be given until long after the muscular pain and tenderness have disappeared. The blighting influence of hide-bound tradition has, I believe, tempted many of us to put too much faith in these procedures. "Electrical treatment we regard as of no value. Not only that, but it often leads to the neglect of more rational measures." During the three or four months subsequent to the onset of the disease, the treatment the patient most requires is rest and the prevention of deformities. Not

a single patient who has been under our care during this last epidemic has had any treatment other than good nursing, the prevention of deformities and rest during this period. One cannot emphasize too strongly the importance of rest. This point was stressed time and again by the late Sir Robert Jones and others well qualified to speak on this subject. Recently we have kept the patients who were under our care at rest for much longer periods than ever before, and have been extremely well pleased with the results. Rest does not mean that the patient must be always kept in one and the same position but rather the avoidance of exercise which would cause muscular fatigue. In many cases it is difficult to get the parents of children to realize that when the patient is resting anything worth while is being done. They want more action and often times will go where they can get it. It was ever thus.

Rest.

Anterior poliomyelitis is an affection of the whole nervous system. Therefore, the patient at first requires complete rest, both mental and physical. How are we to obtain this? (1) By putting the patient to bed having first fitted the bed up with boards between the spring and a firm mattress. Use light warm bed clothes, and keep the weight of the bed clothes off the toes. Put a board crosswise at the foot of the bed against which the patient can place his or her feet and so keep them at right angles to the legs. Keep the knees slightly flexed, the lumbar spine supported with a folded sheet and at least part of the time keep the patient's trunk straight on the bed so as to avoid the development of scoliosis. (2) Also see to it that the patient gets plenty of fresh air and sleep. The patient's position in bed must be changed frequently in order to prevent the weariness which comes from lying too long in one position. As soon as the pain begins to subside the joints should be gently moved and the range of movement increased as time goes on. In carrying out these movements, fatigue and undue stretching of muscles is to be avoided. I mention the matter of moving the joints because if left too long in the straight position they will eventually become so stiff that only a slight range of movement can be obtained.

Deformities.

Deformities can, and often do, develop when the patient is in bed. They develop because: (1) The patients are apt to lie too long in the most comfortable position and often that is with the joints in too much flexion or extension, i.e., not in the neutral position. (2) Because some groups of muscles are stronger than their opponents and so keep the joint flexed or extended over too long a period of time; the trunk may be drawn to one side producing a scoliosis, the head bent to one side, the arm kept close to the trunk, the

hip joint flexed, the knees flexed, and the ankle joint extended. All of the above mentioned deformities can be prevented. The prevention of deformities is much less spectacular work than the correction of them, but is much better for the patient. Deformities develop insidiously and often pass unnoticed by parents until the condition is well established and the golden opportunity for preventing them has passed by. This is well illustrated in cases of scoliosis.

The prevention of deformities will reduce to a minimum:—the suffering which the patient will have to endure; the number of cutting operations; the length and cost of hospitalization and shorten the total period of treatment.

How Can Deformities Be Prevented?

We have already mentioned the procedure to be adopted during the early acute stage. We should follow up the cases after the acute stage is over instead of allowing them to be neglected as some of the parents are prone to do. The patients should be examined frequently. If the joints of the limbs tend to contract it is best to put them in plaster dressings which are well padded, preferably with felt. In the case of oncoming scoliosis, fit the patient with a plaster bed. Do not include the chest as that would restrict respiration. Later when the patient is up, use splints to keep the limbs and trunk in good alignment. Plaster dressings are heavy and should be avoided when possible. Bed patients should have breathing exercises. If deformities develop they can be corrected in the earlier stage by giving an anaesthetic, manipulating the joint into good position and applying a plaster dressing. In the later stages tendon lengthening, tendon transplanting and osteotomies will be required.

Management during the Convalescent stage (i.e., the position of the patients of the 1936 epidemic at the present time).

Now that we have come to the convalescent stage we must carry out more active measures than previously. This is the time to begin muscle re-education by means of active exercise and massage. The patient should be encouraged to do everything that he can for himself and not to regard himself as a cripple. If all the cases which occurred in this Province last year were thoroughly examined at the present moment, it would be found that already some of them have developed deformities which require immediate correction. If these are not corrected while the muscles can be stretched, under an anaesthetic, cutting operations will be required. This we want to avoid. Cases which some months ago we thought had made a perfect recovery, will now be found to have atrophy of certain muscles or groups of muscles; their endurance below par, ankles weak, feet pronated, knees hyper-extended or flexed, possibly a tendency to knock-knee and perhaps, most serious of all, to be developing a lateral curvature. What should be done immediately? Examine the patients in your

district. Do not accept the patient's statement that the child is all right. They do not know. Bring the patients into your office, strip them naked and examine them thoroughly. They may require to have their shoes modified in order to correct pronation of the feet, or to be fitted with a splint to support the ankle, knee or spine, or to abduct the arm at the shoulder joint. The Tendo Achilles or some other muscle may be contracting and so producing a deformity which should be corrected at once. It may be that some of these patients require exercise, active or passive, to develop and strengthen certain groups of muscles.

Exercise.

Active exercise for muscles which have the power of active contraction is the procedure of choice. One has often observed a great increase in the size and strength of the muscles in a lower limb following stabilization of an ankle or foot which hitherto had been flail, and, therefore, unable to bear weight. With exercise the bones increase in size, strength and density. Exercises should be planned so as to develop the weak muscles and the plan must be changed from time to time as groups of muscles recover. Muscles which are too weak to support a joint must be exercised passively. This helps to preserve the muscular tone and increase circulation.

It should be noted that muscles do not work to advantage when they are cold. Therefore, before exercises, active or passive, are begun, the body and limbs should be at normal temperature. The temperature and circulation in a paralyzed limb are below par and in cold weather the limb requires extra clothing. I have not had any personal experience with operative procedure to increase the temperature or growth of a limb but understand that in certain cases this procedure is beneficial.

The Condition of the Bones in Infantile Paralysis.

An X-ray of the shaft of a bone shows that it is smaller than normal; that the cortex is thin and rarified. Clinical examination shows that the bone does not grow normally in length or diameter; that shortening of two to four inches in a long bone is quite common and four to six inches in a limb is not at all rare. If cut down on or cut into, one sees that the periosteum is thin and easily detached from the bone; that the cortex is thin, soft and somewhat bloodless, and that the medullary cavity is filled with dark dead-looking marrow. The long bones are weak and easily fractured and care must be taken in order to avoid accident. However, following a fracture or osteotomy, the bone unites quite readily.

If after a thorough course of physical therapy it is found that muscular recovery has ceased, resort must be had to more radical measures such as tendon lengthening, tendon transplanting, osteotomies and stabilization of joints. This

brings us to the third stage which is that of permanent partial disability. One cannot attempt to describe operative treatment in detail. In this stage operative treatment goes hand in hand with corrective exercises and muscle re-education. When the patient reaches the adolescent age, tendons may be transplanted so as to distribute to better advantage, the muscle power which remains. Flail joints may be arthrodesed as in the case of a knee or stabilized by doing an astragalectomy as in the case of an ankle. In a case where lateral curvature is increasing, a portion of the spine may be made more stable by doing a fusion operation. In general, one makes use of bone operations to correct deformities, to support joints where the muscles do not function properly, and to equalize the length of the lower limbs. This enables the patient, to some extent at least, to do without splints and apparatus which are heavy and cumbersome. To do this work a certain amount of hospitalization is required. Patients who have to wear plaster dressings for several weeks or months should be discharged to their homes as soon as they feel well following operation, and so save an enormous amount of public money. Moreover, from the point of view of the patient's morale, it is good practise to keep them out of hospital as much as possible.

It is a difficult problem to follow up and treat many of those paralytic patients. This, because some of them are in poor financial circumstances, are indolent and thriftless, are too lazy to take advantage of help when it is offered to them and are willing to lay down in the lap of social service organizations, municipal and government relief. I once thought that if hospital and medical care, splints and appliances could be provided to indigent patients free of charge, all would be well with them. This idea is wrong. Few patients take proper care of apparatus supplied free. They are apt to lose their independence and capitalize their disability in order to live without work. This they do, little thinking that every dollar they get without giving value in return, they get at the expense of their own moral fibre.

It is not reasonable that people who are being supported by public funds should refuse operative treatment which would make them physically fit so that they can support themselves. Nevertheless we have such people with us. They ought not to be allowed so to do. I submit that there might be appointed a representative unsalaried impartial independent commission, which, on the advice of competent medical authority, could obtain a court order compelling certain selected cases, who are in receipt of public funds, on account of their physical disability, to undergo such medical and surgical treatment as would render them fit for work.

When kind parents and organizations have done all they can for these cripples; when medicine, physical therapy and surgery have finished their task, when academic studies are complete,

and when adult age is reached, there still remains the equally important problem of building these unfortunate people into the structure of society. The problem is especially difficult here; because of the cold weather making it hard for them to get around, due to the fact that their limbs are easily frozen and they have to wear heavy clothing; because farming is carried on on a large scale and they do not fit into this plan the same as they would into a plan of mixed farming, and because of the lack of light industrial and commercial employment. These are some of the conditions which make it hard for cripples to obtain work.

It must be that long years of crippleddom reduce one's energy, and ambition, and makes one feel like giving up the fight. Small wonder that some of them do. It is unavoidable, but at the same time unfortunate, that there is no organized method of weaving these people into the structure of human affairs, after their medical treatment is completed.

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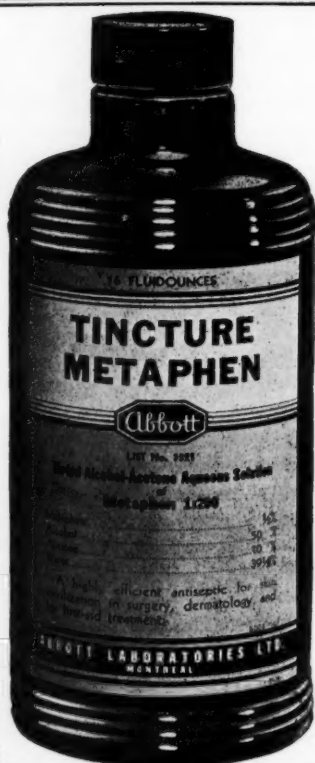
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